My next piece of good fortune came in being accepted as a postdoctoral fellow at Harvard by Francis Birch. I count the eighteen months spent in his laboratory as the most stimulating and rewarding of my career. Thence in 1959 to Canberra, where a new university containing a Department of Geophysics was in the making. The Australian National University showed great wisdom in picking John Jaeger as its foundation professor of geophysics. He knew instinctively how to create a good research environment and how to inspire an enthusiastic group of young researchers. The spirit and vigour of this group over the years has been excellent, and there has been considerable cross-fertilization of ideas and collaboration in joint projects, often of an interdisciplinary nature. It has been a privilege to work in this environment, and I have no hesitation in saying that a considerable part of the credit for any successes that may have come my way is shared by my colleagues.

It was very satisfying in recent years to have played a role in persuading the university to recognize the intrinsic importance of the earth sciences. As a result, there will be a major expansion and diversification of earth science research in Canberra during the coming years. We are looking forward with much excitement to these developments.

Thank you, Joe Boyd, for your generous introduction. It is a great pleasure to accept this Bowie Medal on behalf of my colleagues as well as myself.

Thank you all very much indeed.

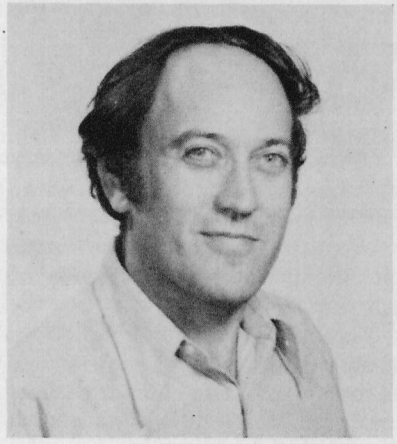
A.E. Ringwood

Thirteenth Presentation

JAMES B. MACELWANE AWARD

to

AMOS M. NUR



in recognition of significant contributions to the geophysical sciences by a young scientist of outstanding ability

AMOS NUR was born in Haifa, Israel, in 1938 and received his early education in Israel and Switzerland. He received his B.Sc. in Geology in 1962 at the Hebrew University, Jerusalem, and his Ph.D. in Geophysics from MIT in late 1969. Between 1957 and 1963 he served with the Israeli army, explored for minerals in southern Israel, and did geological mapping in the Swiss Alps. Since 1970 he has been an assistant professor in the Geophysics Department at Stanford University. He is president-elect of the Tectonophysics Section of the American Geophysical Union.

His research interests include the physical properties of rocks, processes in the crust and mantle, paleomagnetism, heat flow, and earthquake prediction.

His discovery of velocities in low-porosity crystalline rocks, in particular the role of pore fluids, provided the conceptual framework for explaining precursory phenomena of earthquakes and led to the Nur hypothesis of earthquake prediction. His experimental ultrasonic results and his clarification, with S.K. Garg, of the effective stress law showed that the opening of dry cracks, rather than an increase in effective stress, was responsible for the decrease of velocity ratios in the crust prior to earthquakes. The dilatancy hypothesis is now the working framework for much of the earthquake prediction research in this country.

With his co-workers R. Kovach, J. Booker, and A. Johnson, he has clarified the role of pore fluids and pore pressures in a variety of geophysical and tectonic contexts, including fault creep, aftershocks, and low-velocity zones. With S. Garg he has reformulated and clarified the effective stress law. By combining the disciplines of rock mechanics, hydraulics, and seismology, he has provided a bridge between laboratory and field observations as they relate to the interpretation of seismic velocities and processes in the focal region of earthquakes.

In addition to his contributions to tectonophysics and seismology, he has also done experimental work on granular material to help explain lunar data on the regolith. He has published thirty papers since 1968.

Don L. Anderson
(Read by A.J. Dessler)

Acceptance and Response

I am very grateful and honored to receive the Macelwane Award. When I was first told about it I was naturally very pleased, but soon afterward I realized that there is a snag—I have to give a little speech in response.

What do you say on such an occasion? At a loss, I went back and read past AGU speeches for awards in various sections. I discovered that they all had one thing in common; every one of the speakers thanked his teachers, his peers, and his students for their invaluable contributions to the work for which the award was given.

Well, this is exactly what I myself had in mind to say. Why is this? Are we all just so polite? Knowing some of the past recipients of this award, I had to dismiss this explanation quickly, of course. I think the cor-

rect explanation is that extensive cooperation in geophysics, and earth sciences in general, is not only a nice thing to have but is actually an essential aspect of what we must consider as our present 'scientific revolution.' Joining efforts is, perhaps unlike in other sciences, an absolutely necessary condition for our progress. Because we deal with broad interdisciplinary studies, no one can make much progress unless many make some progress.

So now when I thank my teachers, colleagues, and students, I do so with the clear knowledge that their scientific activities are inseparable from the work for which this award is given. I therefore accept this award, representing a large group of scientists, and consider it as a confirmation of the success of their joint efforts.

Thank you.

Amos Nur

Sixth Presentation

WALTER H. BUCHER MEDAL

to

MAURICE EWING

for original contributions to the basic knowledge of the earth's crust

MAURICE EWING was born in Texas in 1906. He had all his collegiate and university training at Rice University, where he received the doctorate in physics in 1931.

He first taught at Pittsburgh and Lehigh Universities in the days when research grants were few, small, and hard to come by. He was able, though, to wangle some support for seismic profiling of the Coastal Plain, with fascinating but tantalizing results. What does the continental shelf look like?

After research during World War II on the acoustics of the sea, he had his chance to find out. Made head of the new Lamont Geological Observatory of Columbia University, he was finally able to get the support, in ships and equipment—much of which he designed himself—for research on the ocean floor.

To Ewing, oceanography meant everything from the physical properties of sea water to the structure of the ocean floor, from the causes of glacial ages to the determination of the Pleistocene-Holocene boundary, from turbidity currents to sea floor spreading.

A year or two ago, his native state called him to organize a new oceanographic institution for the University of Texas. We may be sure that his stimulating work will continue in this new environment.

Maurice has been honored on many occasions for his contributions in many fields. Our committee, however, felt that his work on earth structure has been so in the tradition of Walter Bucher that the award to him of the Bucher Medal is singularly in good order.

Mr. President, your committee unanimously and enthusiastically commend to you Maurice Ewing for the award of the Bucher Medal.

James Gilluly
(Read by Frank Press)

On May 4, 1974, Maurice Ewing died after a brief illness. Professor Ewing was president of AGU from 1956 to 1959. He will be deeply missed by all who knew him and his outstanding contributions to geophysics. (Ed.)